



Conversion of Exhaust Gas Aldehydes on Ferro-Manganese Crusts

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Objective

To investigate and determine the chemical conversion of aldehyde compounds on manganese crusts at low temperatures for application in reducing alcohol fuel exhaust emissions.

Approach

A glass vacuum manifold was used to measure the adsorptive capacity of our special manganese crust (BHB) at room temperature for acetaldehyde, water, and carbon dioxide (CO_2).



Researcher opening chamber on experimental vacuum rack

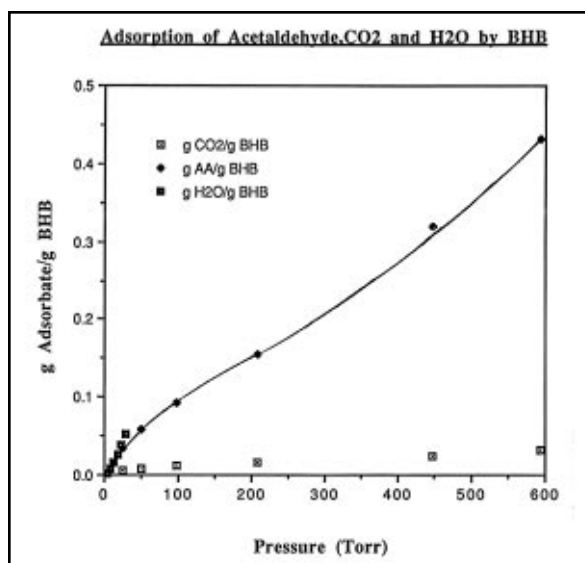
Accomplishments

Multiple experiments have indicated an average adsorption of 450 mg of acetaldehyde per gram of our crust. By contrast, only 31 mg of CO_2 and 53 mg of water are adsorbed. Our special material has an extremely high affinity for acetaldehyde.

Future Direction

To complete our present task, we will extend our work to higher temperatures, monitor the products desorbed during desorption to determine whether our material can catalytically convert acetaldehyde to safer by-products, and examine the aldehyde adsorption bond structure using x-ray emission spectroscopy.

During the proposed second phase, we will study the adsorption of various mixtures of gases such as water, CO_2 , and select hydrocarbons (HCs); try other crust materials; attempt to treat our material chemically; study various phases; and try to synthesize crust-like material.



Publications

None to date.